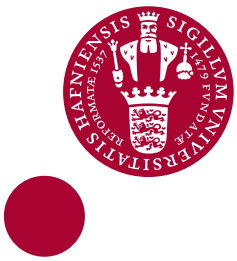

Water resilient green cities in Africa Newsletter issue 2

Leapfrogging conventional urban water systems to landscape-based systems

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Water Resilient Green Cities in Africa

Newsletter

October 2015

Leapfrogging conventional urban water systems to landscape-based systems

Many cities around the world are exploring green infrastructures with landscape-based systems as solutions to complement the limited capacity or extend the conventional water systems. In addition to improving flood protection, these landscape-based systems can support water supply, groundwater recharge and provide additional ecosystem services to the benefit of the citizens' everyday life. Cities in Africa, like Addis Ababa, Ethiopia and Dar es Salam, Tanzania, do not have adequate city-wide conventional urban water systems like centralized, pipe-based water supply, drainage and sanitation systems. Therefore, an option to explore if these cities can leapfrog to landscape-based stormwater management and simultaneously provide selected additional benefits is wanting. Three pathways are identified for this leapfrogging, and are under testing in the WGA-project:

A reliable catchment plan as a basis
A catchment plan is being drafted by using GIS- and field analysis as a baseline for the water situation and by collecting narratives, performing design charrettes combined with 1:1 demonstration at selected sites, and setting up workshops with professionals to suggest green infrastructure coping measures. The draft catchment plan will be presented to decision makers for adoption into relevant administrative practices.

A rapid mind-set change through champions
Training for catalyzing a rapid mind-set change is being developed and conducted, targeting potential champions from the city administration and other key stakeholders. Design charrettes also support the rapid mind-set change by involving local communities.

Smart dissemination methods
Later in the project, most promising practices for green infrastructure design for water management and ecosystem services are planned to be disseminated as free smart phone apps, including instructions on e.g. stormwater harvesting, interception swales for groundwater recharge, swale-cropping-dykes, green street drainage systems, and organic waste composting swales.

During the 2nd year of the project, knowledge generation on green space and its use, water stresses and coping as well as important institutional structures including main stakeholders have taken place through stakeholder workshops, interviews, orthophotos and GIS analysis. Initial ideas for solutions and 1:1 pilot site ideas have been developed, through a series of workshops when the six PhD students of the project stayed in Copenhagen and during the project conference in Addis Ababa January 2015. The 1st design charrette was carried out in Addis Ababa in June 2015.

Design Charrette

What is Design Charrette?
The use of the term is said to originate from the École des Beaux Arts in Paris during the 19th century, where proctors circulated a cart, or 'charrette', to collect final drawings while students frantically put finishing touches on their work. Now the planning and design society refers to it as a multiple-day collaborative design and planning workshop held on-site and inclusive of all affected stakeholders. There are growing design charrette practices in particular in the United States and Germany. According to the American National Charrette Institute, Charrette is 'a collaborative planning process that harnesses the talents and energies of all interested parties to create and support a feasible plan that represents transformative community change'.

Design Charrettes in the WGA project

Design charrettes are introduced as a research method for achieving 1:1 pilot project design solutions. It is assumed that 1:1 pilot projects with stakeholder involvement will provide stronger impact and extend further beyond the borders of the project. The first design charrette has been carried out in a condominium area at the mid-stream case site along Jemo River, Addis Ababa. Experiences gained from the first design charrette will be applied in a design charrette in Dar es Salaam.

The condominium case site under flooding

The 1st Design Charratte in Addis

After a careful planning by the Addis team, with support by the IGN team, a three-days-long design charrette was held at the condominium case site in Addis Ababa on June 26-28, 2015. The goals of the design charrette were to co-design with the local people, to develop a site plan that applies open spaces with landscape-based solutions for mitigating water stresses, at the same time providing multi-benefits for locial residents, like promoting recreation and the quality of open spaces and increasing water supply for urban agriculture. The researchers from Addis Ababa formed the core team of the design charrette with Antje Backhaus and Lise Herlund from IGN as resource persons for the process. Groups of local residents paticipated in the discussion, the design process and the work towards a joint solution. At the end of the design charrette, a site plan with various landscape-based solutions was produced and presented. The Deputy Head of the Addis Ababa City Construction and Housing Development Bureau, Mr. Yonas Ayalew graced the opening speech and a closing ceremony of the design charrette. He was impressed by the new plan.

Residents discussion on potential solutions

The children's competition and women engagement

A school children group participated in a drawing competition, to express their ideas for using green spaces and incorporating water in their local area. A women's group was also engaged in providing practical ideas based on their day-to-day life experiences. These groups are both victims of insufficient urban water services and the most frequent users of the green spaces. Their involvement is considered by the project to be vital for finding a feasible site plan that also makes sense for the local people.

The children's drawing competition

Result of Design Charette: A promising site plan

The final plan Jemo Condominium, Biruh Tesfa association

The final plan includes three major interventions: 1. Water sensitive green field to be developed on the three identified wet spots by incorporating garden benches, podiums and playfield equipment. 2. Urban agricultural field will be developed by subdividing the available open green space into 11 plots and introducing walkways for circulation. 3. Remodeling the existing main parking lots to share the excessive land for central play field of the community. Furthermore, the plan also incorporates maintenance and improvements of the existing drainage facilities (open ditches), walkways and greeneries.
After the design charrette, the Addis team have detailed the final plan and estimated the budget for implementation. A detailed report on the design charrette and the final plan has been submitted to the Municipality of Addis. The plan has got interest in the city administrations. Now the possibility of implementing the plan is being explored.

Lesson learned from the design charrette

The locals are also happy for the plan and feel proud that they have taken part in making it, because they not only made a plan for water management but also embedded in it their wishes for their area, such as new playgrounds, places to farm and places for the elderly. This means that going a step beyond normal participatory processes and developing an actual plan is important. In turn, it makes people identify more with the project and thus enhances ownership.

The challenge in this process has been to engage the 'system' in the process, e.g. who should the new plan be 'handed over' to and how to keep up the momentum especially ensure sustained change of mind set among the local people?

Inspiration for Dar es Salaam

The design charrette was presented to the local committee in the case site in Dar and immediately got their interest to carry out a similar process.

FAST FACTS

Project title:	Water Resilient Green Cities for Africa
Main funding source:	Danida
Duration:	September 2013 – August 2017
Size:	9,054,244 DKK
Partnership:	Three partners from three countries
Coordinator:	Department of Geoscience and Nature Management University of Copenhagen
Website:	www.watergreenafrica.dk

Project team talked to a local people at a borehole in Addis

Project team talked to a local people at a borehole in Addis

Meeting the locals at the condominium site in Addis

SELECTED PROJECT PUBLICATION

Scientific article

Green infrastructure for flood-risk management in Dar es Salaam and Copenhagen: Exploring the potential for transitions towards sustainable urban water management

Intermediate results

Report1-WP1_ Green area typologies and mapping of green structures in Addis Ababa and Dar es Salaam

Report 1-WP2_ Urban Water Management in Addis Ababa and Dar es Salaam

Report 1-WP3_ Institutional Analysis - Addis and Dar

Conference presentations

Leap-frogging towards water resilience in Dar es Salaam and Addis Ababa

Green and sustainable cities: the role of landscape architecture

Master thesis

The crucial need of urban open spaces in the adaptation to climate change - A case study of the use, function and perception of the open spaces in the unplanned settlement Kawe Ukwamani in Dar es Salaam

Water resilience and social capital - Comparing informal and formal housing areas in Addis Ababa

Options for landscape based stormwater management & green infrastructure in urban areas within developing countries

Web documentation

'By under vand (City under water)' (Video, text in Danish)

WGA People

This issue focuses on the PhD students. All six PhD students have worked and attended courses and workshops at the University of Copenhagen for three months during autumn 2014. Although there were challenges to adapt to new environment for a long period, all the PhD students felt that they had gained much knowledge through the stay.

In Copenhagen, the PhD students have attended a series of training sessions and workshops: GIS training, Introduction to University Pedagogy, Baseline status, current challenges and coping strategies. Also discussion on project hypothesis, physical solutions, planning instruments and design charrette were held. The course on 'Urban Ecosystems' offered by IGN, University of Copenhagen, with focus on landscape-based stormwater management, has a strong influence on the PhD students. They all look forward to applying the knowledge they learned in the context of their own cities.

Another highlight was the 'first loop' design workshop. The PhD students from the same city worked within their city group and formulated the city challenges. Then based on the problem formulation provided by the other city, they acted as consultants to suggest concrete solutions to the other city. For example, the Addis team suggested an overall green structure vision to Dar es Salaam, supplemented with landscape-based measures such as regulating sand mining, roof top rainwater harvesting, and retention ponds at community level. The 'first loop' design workshop gave inspiration on how to transfer the existing knowledge to concrete solutions, an approach that is also applied in other project activities such as design charrettes and training workshops.

PhD workshop at IGN, University of Copenhagen

Upon return to their home universities, some of the PhD students have started 1:1 experiments of landscape-based stormwater management.

ALAZAR ASSEFA WONDIM

Alazar is an urban designer. His PhD project is about 'Multi-functional green infrastructure design and technologies for landscape based stormwater management of Addis Ababa: the case of Jemo river watershed'.

What are the most beneficial things you have learned from your stay in Denmark?
Almost all I learned from Denmark is beneficial for my future work. The most useful stuffs are those from Urban Ecosystem course, e.g. how to design and develop stormwater management elements, particularly the sizing of each element and real on-site test.

What are the most useful things that you can apply in your own country?
The infiltration elements for stormwater management are the most useful things that I can apply.

What is the best experience of your stay in Denmark?
I like the experience of learning in a multi-disciplinary environment. I realized that dealing with one subject requires expertise from different professions.

What is the less appreciated experience of your stay in Denmark?
The only thing I do not like is the cold weather in Demark. It makes you intend to stay indoors most of the time.

What have you been doing recently on WGA project, especially the 1:1 test?
Right now I am preparing working design for 1: 1 test of LSM design elements on Biruh Tesfa cooperative of Jemo 1 condominium site. It is part of lower case site research activities of the PhD. We have submitted a draft catchment strategy to the Mayer office. The implementation of the design element will begin after the approval of the catchment plan by the municipality of Addis. Parallel to this I also establish partnership with the local community and government organs to identify 1:1 test site for the upper stream case area around Repi hill.

GIVEN JUSTIN MHINA

Given is an Environmental Engineer. His PhD project is about 'Needs and options for stormwater quality and quantity management in the City of Dar es Salaam'.

What were the most beneficial things you have learned from your stay in Denmark?
The course Urban Ecosystems was really 'game changer' for my PhD work. If I had only to go through the literature, it could take me a year to gain what I got from the course. I know now what I am doing.

What were the most useful things that you can apply in your own country?
I think that I can apply almost everything I got from the Urban Ecosystem course to my country. But to start with, the Modified Dual Porosity Filter idea is a good measure to try when I get back.

What was the best experience of your stay in Denmark?
It is really cool going all over the city with a bicycle. That is really nice. That is something that I will miss a lot.

What was the less appreciated experience of your stay in Denmark?
I could not get any ugali in Copenhagen. That is my local food. I miss it a lot.

What have you been doing recently on WGA project, especially the 1:1 test?
I have just finalized data collection exercise from a lab scale modified dual porosity filter. The idea is to use of gravels as filter media in dual porosity filtration of storm runoff. The lab results are promising and the filter may be used to support water supply for poor communities. Currently, areas suitable for pilot installation of the modified dual porosity filter are being investigated.

A glance of the past year

PhD students stay in Denmark
August 25, 2014 – November 22, 2014
All six PhD students stayed in University of Copenhagen and were accommodated at the Danida Fellowship Center, Denmark. A series of training courses and project workshops were held for the PhD students.


PhD workshop at IGN, University of Copenhagen

IARU Sustainability Science Congress presentation-October 24, 2014
Lise Herslund and Antje Backhaus (IGN), together with all six PhD students, attended the IARU Sustainability Science Congress in Copenhagen. Lise and Antje made a platform presentation 'Leap-frogging towards water resilience in Dar es Salaam and Addis Ababa', with early results of the project.

Danish authority representatives visited project partner in Dar-October 30, 2014
Representatives from the Danish Ministry of Foreign Affairs and the Consultative Research Committee from Development Research (FFU) visited Ardhi University. Professor Kombe, Dr. Mrema and Dr. Tatu presented the status of the project. Challenges and solutions of the project partnerships were introduced and discussed. The representatives were impressed by what the project has been carried through so far.

2nd Project conference in Addis
January 25 – January 28, 2015
The 2nd Project Conference was held in Addis Ababa. All project members were gathered together and discussed the project status and the plan for future activities. The major topics addressed at the conference include:
- PhD students project progress;
- Research papers plan;
- Main findings by Work Packages;
- Reflections on the project process;
- 1:1 ideas and progress;
- Methods and plans of design charrettes;
- Site visit to the condominium case site.


Exercise at the training workshop in Addis

Training workshop for Addis Ababa stakeholders-January 29 – February 1, 2015
Related with the 2nd Project Conference, a training workshop on 'Urban Green Infrastructure and Ecosystem Services' was held for professionals in Addis Ababa. EiABC and IGN organized and conducted the training. All WGA members participated. The stakeholders' mind-set change was evaluated. The participants showed a strong interest in the topic. Mr. Yonas Ayalew, deputy head of the Addis Ababa City Construction and Housing Development Bureau, Dr Kumelachew and Prof Marina handed over a training certificate to all participants by the end of the training.


Certificate handover at the training workshop in Addis

Stakeholder meeting in Dar es Salaam
May 11, 2015
The Dar team held a stakeholder round-table meeting on May 11th 2015. Representatives from the Prime Minister's Office, Disaster Management Department, the National Environmental Council, the Kinondoni Municipal Engineer, the Drainage Engineer from the Ministry of Works and the Municipal Agricultural Officer were among the participants. In addition, Ward representatives from the Sub-ward case study areas of Mbezi Luisi, Goba Kibululu and Kawe Ukwamani were invited. Landscape-based stormwater management and its relevance to the locals were discussed, as well as the challenges and possible solutions. Participants were also appraised on the progress so far made by the project.


Stakeholder workshop in Dar

Green infrastructure article submitted to Landscape and Urban Planning
September, 2015
A scientific paper entitled 'Conditions and opportunities for green infrastructure – aiming for green water resilient cities in Addis Ababa and Dar es Salaam' has been submitted to the scientific journal *Landscape and Urban Planning*. The paper is based on updated data from the WGA project and the earlier CLUVA project, which all three institutes were involved in. If accepted, the paper is expected to be published in 2016.

Fieldwork in Addis and Dar-June 29-July 2, 2015
The IGN researchers Antje Backhaus and Lise Herslund went to Addis on June 22-29 and Dar on June 29-July 2, 2015. The purposes were to take part the 1st design charrette in Addis, to continue data collection and to discuss on the livelihood study and catchment characterization, along with the preparation of the design charrette and training workshop in Dar, supervision of PhD students and general project coordination.

1st design charrette held in Addis
June 26-28, 2015
The 1st design charrette was successfully held in Addis. A site plan was produced. See page2.

The coming half year

The IGN's external researcher Ole Fryd has been awarded a 5-months special studies program by the University of Melbourne to visit IGN (Aug), EiABC (Oct-Nov) and Ardhi University (Sept, Dec) as a contributor to the WGA research project.
Jasmina Gabel will stay in Addis Ababa from mid-November and 4 to 6 months. She is an urban planner and landscape architect from Gladsaxe municipality and will be based in the Housing and Construction Bureau and the Urban Planning Institute in Addis.
The 3rd Project Conference will be held in January 2016 in Dar. Please see more on the project website.

WGA Partners

University of Copenhagen, Denmark

UNIVERSITY OF COPENHAGEN

Addis Ababa University, Ethiopia

EiABC
Ethiopian Institute of Architecture, Building Construction and City Development
Addis Ababa University

Ardhi University, Tanzania

ARDHI UNIVERSITY
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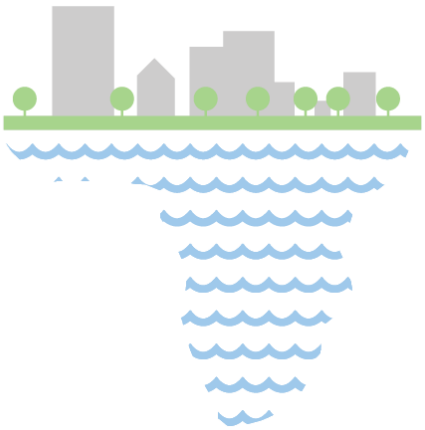

Water Resilient Green Cities in Africa is a project funded by Danida

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